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IN THE CLAIMS

1. (Original) A method of making a digitally imaged relief-printing plate comprising the steps of:

   a) providing a collapsible curable layer comprising (i) a curable elastomer, (ii) a material that absorbs laser light at a selected wavelength, and (iii) microspheres, between a cover sheet and a backing sheet to form a printing plate;
   b) exposing the collapsible curable layer through the backing sheet to establish a floor layer;
   c) removing the cover sheet from the printing plate;
   d) using a laser to collapse and melt portions of the collapsible curable layer to form a relief image on the printing plate; and
   e) curing said curable layer by face exposure to crosslink and cure said formed relief image.

2. (Original) A method according to claim 1, wherein said printing plate further comprises a thin layer of non-collapsible curable elastomer between the collapsible curable layer and the cover sheet of the plate.

3. (Original) A method according to claim 1, wherein said curable layer is cured by exposure to UV radiation.

4. (Original) A method according to claim 1, wherein as the relief image is formed on the printing plate, the printing plate is simultaneously bump-exposed, to collapse at least a portion of said collapsible curable layer to create a final printing surface on said printing plate.

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5. (Original) A method according to claim 1, further comprising a step of laser collapsing at least a portion of said formed image to form a denser printing surface.

6. (Original) A method according to claim 1, wherein the backing sheet comprises polyethylene terephthalate.

7. (Original) A method according to claim 1, wherein the cover sheet further comprises a slip film or a release layer.

8. (Original) A method according to claim 1, wherein the curable elastomer of the collapsible curable layer comprises a binder, a plasticizer, one or more curable monomers, and a photoinitiator.

9. (Original) A method according to claim 8, wherein said one or more curable monomers are curable by UV-light.

10. (Original) A method according to claim 1, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

11. (Original) A method according to claim 10, wherein said unexpanded microspheres have an initial particle size of 6-16 μm and a particle size upon expansion of 20-40 μm, with a corresponding change in density from about 0.8 to 1.1 g/cm^3 to between about 0.02 and about 0.06 g/cm^3.

12. (Currently amended) A method according to claim 1, wherein the collapsible ~~UV-curable~~ curable elastomer composition comprises about 1% to about 15%, by weight, of the microspheres.

13. (Original) A method according to claim 10, wherein said microspheres are unexpanded microspheres and the collapsible curable elastomer composition is first mixed at a temperature below the expansion temperature of said unexpanded microspheres and the temperature is then gradually increased to facilitate expansion of the microspheres.

14. (Original) A method according to claim 1, wherein the collapsible curable elastomer layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

15. (Original) A method according to claim 1, wherein said laser is a plate setter infrared laser operating at a wavelength of 830 nanometers or 1064 nanometers.

16. (Original) A method according to claim 15, wherein said material that absorbs laser light at the selected wavelength is selected based on the operating wavelength of the plate-setter laser.

17. (Original) A method according to claim 16, wherein the material that absorbs laser light at the selected wavelength is an infrared dye or pigment.

18. (Original) A method according to claim 17, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

19. (Original) A method according to claim 1, wherein the laser is an IR-laser that uses different energy densities to create areas of different depths on the relief image.

20. (Original) A method according to claim 1, further comprising a step of post curing and detacking said printing plate.

21. (Original) A digitally imaged relief-printing plate comprising:

a collapsible curable layer comprising: (i) a curable elastomer, (ii) a material that absorbs laser light at the selected wavelength, and (iii) microspheres;

wherein the printing plate comprises a relief image formed from selectively collapsed and melted portions of the collapsible curable layer; and

wherein the printing plate is cured to cross link and cure said relief image.

22. (Original) A printing plate according to claim 21, wherein said printing plate further comprises a thin layer of non-collapsible curable elastomer.

23. (Original) A printing plate according to claim 21, wherein said curable layer is cured by exposure to UV radiation.

24. (Original) A printing plate according to claim 21, further comprising a collapsed top layer of the collapsible curable layer that creates a denser printing surface.

25. (Original) A printing plate according to claim 21, wherein an IR-laser is used to produce said selected collapsed and melted portions of the collapsible curable layer.

26. (Original) A printing plate according to claim 21, further comprising a polyethylene terephthalate backing sheet.

27. (Original) A printing plate according to claim 21, further comprising a coversheet having a slip film or a release layer.

28. (Original) A printing plate according to claim 21, wherein the curable elastomer of the collapsible curable layer comprises a binder, a plasticizer, one or more curable monomers, and a photoinitiator.

29. (Original) A printing plate according to claim 28, wherein said one or more curable monomers are curable by UV-light.

30. (Original) A printing plate according to claim 21, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

31. (Original) A printing plate according to claim 21, wherein the collapsible curable elastomer layer comprises about 5% to about 15%, by weight, of the microspheres.

32. (Currently amended) A printing plate according to claim 30, wherein said microspheres are unexpanded microspheres and the collapsible ~~UV-curable~~ curable layer is first mixed at a temperature below the expansion temperature of said unexpanded microspheres and the temperature is then gradually increased to facilitate expansion of the microspheres.

33. (Original) A printing plate according to claim 21, wherein the collapsible curable layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

34. (Original) A printing plate according to claim 25, wherein said material that absorbs laser light at the selected wavelength is an infrared dye or pigment that is selected based on the operating wavelength of the IR-laser.

35. (Original) A printing plate according to claim 34, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

36. (Original) A printing plate according to claim 25, wherein the IR-laser uses different energy densities to create areas of different depths on the relief image.

37. (Original) A printing plate according to claim 24, wherein said printing plate is further post cured and detacked.

38. (Original) A method of making a laser imageable printing sleeve comprising the steps of:

    a) providing at least one collapsible curable layer on a sleeve carrier;

    b) providing a cap layer of a non-collapsible curable elastomer on the at least one collapsible curable layer;

    c) using a laser to collapse and melt portions of the at least one collapsible curable layer to forming a relief image on the printing sleeve with the cap layer acting as the printing surface; and

    d) curing the printing sleeve by face exposure to crosslink the formed relief image.

39. (Original) The method according to claim 38, wherein said sleeve carrier is selected from the group consisting of metals, polymeric films, and polymer/fiber composites.

40. (Original) The method according to claim 38, wherein said at least one collapsible curable layer comprises (i) one or more curable elastomers; (ii) a material that absorbs laser light at a selected wavelength; and (iii) microspheres.

41. (Original) The method according to claim 40, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

42. (Original) The method according to claim 41, wherein said microspheres are unexpanded microspheres and after step b) but before step c), the printing sleeve is baked to create expansion of the at least one collapsible radiation-curable layer.

43. (Original) The method according to claim 38, wherein after step b) and prior to step c), the cap layer is ground to gage and to form a seamless structure having a smooth print surface.

44. (Original) The method according to claim 40, wherein said at least one collapsible curable layer comprises about 1% to about 15%, by weight, of the microspheres.

45. (Original) The method according to claim 40, wherein the at least one collapsible curable layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

46. (Original) The method according to claim 38, wherein said laser is an infrared laser.

47. (Original) The method according to claim 40, wherein said material that absorbs laser light at the selected wavelength is an infrared dye or pigment that is selected based on the operating wavelength of the laser.

48. (Original) The method according to claim 47, wherein the operating wavelength of the laser is 830 nanometers or 1064 nanometers.

49. (Original) The method according to claim 48, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

50. (Original) The method according to claim 46, wherein the laser uses different energy densities to create areas of different depths on the relief image.

51. (Original) The method according to claim 38, further comprising a step of post curing and detacking said printing sleeve.

52. (Original) A method of making a laser imageable printing sleeve comprising the steps of:

a) providing a first collapsible curable layer on a sleeve carrier;
b) curing said first collapsible curable layer to establish a floor layer;
c) providing a second collapsible curable layer on top of said cured floor layer;
d) providing a cap layer comprising a non-collapsible curable elastomer layer on top of said second collapsible curable layer;
e) using a laser to collapse and melt portions of the underlying second collapsible curable layer to form a relief image on the printing sleeve; and
f) curing the printing sleeve by face exposure to crosslink and cure said formed relief image.

53. (Original) The method according to claim 52, wherein said second collapsible curable layer and said cap layer are co-extruded.

54. (Original) The method according to claim 52, wherein said sleeve carrier is selected from the group consisting of metals, polymeric films, and polymer/fiber composites.

55. (Original) The method according to claim 52, wherein said first and second collapsible curable layers comprise (i) a curable elastomer; (ii) a material that absorbs laser light at a selected wavelength; and (iii) microspheres.

56. (Original) The method according to claim 55, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

57. (Original) The method according to claim 56, wherein said microspheres are unexpanded microspheres and after step d) but before step e), the printing sleeve is baked to create expansion of the second collapsible curable layer.

58. (Original) The method according to claim 55, wherein the collapsible curable elastomer composition comprises about 1% to about 15%, by weight, of the microspheres.

59. (Original) The method according to claim 55, wherein the collapsible radiation-curable elastomer composition comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

60. (Original) The method according to claim 52, wherein said laser is an infrared laser.

61. (Original) The method according to claim 55, wherein said material that absorbs laser light at the selected wavelength is an infrared dye or pigment and is selected based on the operating wavelength of the laser.

62. (Original) The method according to claim 61, wherein the operating wavelength of the laser is 830 nanometers or 1064 nanometers.

63. (Original) The method according to claim 61, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

64. (Original) The method according to claim 60, wherein the laser uses different energy densities to create areas of different depths on the relief image.

65. (Original) The method according to claim 52, further comprising a step of post curing and detacking said printing sleeve.

66. (Original) A method of making a laser imageable printing sleeve comprising the steps of:

    a) providing a collapsible curable layer comprising (i) a curable elastomer, (ii) a material that absorbs laser light at a selected wavelength, and (iii) microspheres, on a transparent sleeve carrier;
    b) providing a cap layer comprising a non-collapsible curable elastomer layer on top of said collapsible curable layer;
    c) exposing said collapsible curable layer through the transparent sleeve carrier to establish a floor layer;
    d) using a laser to collapse and melt portions of the collapsible curable layer to form a relief image on the printing sleeve; and
    e) curing the printing sleeve by face exposure to crosslink and cure said formed relief image.

67. (Original) The method according to claim 66, wherein said collapsible curable layer and said cap layer are co-extruded.

68. (Original) The method according to claim 66, wherein said transparent sleeve carrier comprises polyethylene terephthalate.

69. (Original) The method according to claim 66, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

70. (Original) The method according to claim 69, wherein said microspheres are unexpanded microspheres and after step c) but before step d), the printing sleeve is baked to create expansion of the collapsible curable layer.

71. (Original) The method according to claim 66, wherein after step c) and before step d), the cap layer is ground to gage and to form a seamless structure having a smooth print surface.

72. (Original) The method according to claim 66, wherein the collapsible curable layer comprises about 1% to about 15%, by weight, of the microspheres.

73. (Previously presented) The method according to claim 66, wherein the collapsible curable layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

74. (Previously presented) The method according to claim 66, wherein said laser is an infrared laser operating at a wavelength of 830 nanometers or 1064 nanometers.

75. (Previously presented) The method according to claim 73, wherein said material that absorbs laser light at the selected wavelength is an infrared dye or pigment and is selected based on the operating wavelength of the laser.

76. (Previously presented) The method according to claim 75, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

77. (Previously presented) The method according to claim 75, wherein the laser uses different energy densities to create areas of different depths on the relief image.

78. (Previously presented) The method according to claim 66, further comprising a step of post curing and detacking said printing sleeve.

79. (Previously presented) A digitally imageable printing sleeve comprising:

a) a sleeve carrier;

b) at least one collapsible curable layer disposed on said sleeve carrier, said at least one collapsible curable layer comprising: (i) a curable elastomer, (ii) a material that absorbs laser light at a selected wavelength, and (iii) microspheres; and

c) a cap layer disposed on said at least one collapsible curable layer, said cap layer comprising a non-collapsible curable elastomer;

wherein the printing sleeve comprises a relief image formed from selectively collapsed and melted portions of the at least one collapsible curable layer; and

wherein the printing sleeve is cured to cross-link and cure said relief image.

80. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein said selected collapsed and melted portions of the at least one collapsible curable layer are produced by an infrared laser.

81. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein the microspheres are selected from the group consisting of expanded microspheres and unexpanded microspheres.

82. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein the at least one collapsible curable layer comprises about 5% to about 15%, by weight, of the microspheres.

83. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein the at least one collapsible radiation-curable layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

84. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein said sleeve carrier is selected from the group consisting of metals, polymeric films, and polymer/fiber composites.

85. (Previously presented) The digitally imageable printing sleeve of claim 80, wherein said material that absorbs laser light at the selected wavelength is a infrared dye or pigment that is selected based on the operating wavelength of said laser.

86. (Previously presented) The digitally imageable printing sleeve of claim 85, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

87. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein the IR-laser uses different energy densities to create areas of different depths on the relief image.

88. (Previously presented) The digitally imageable printing sleeve of claim 79, wherein said printing sleeve is further post cured and detacked.

89. (Currently amended) A method of making a digitally imaged relief-printing element comprising the steps of:

a) providing a collapsible curable layer on a substrate, said <u>collapsible</u> ~~collapsibile~~ curable layer comprising (i) a curable elastomer, (ii) a material that absorbs laser light at a selected wavelength, and (iii) microspheres;

b) exposing the collapsible curable layer to establish a floor layer;

c) using a laser to collapse and melt portions of the collapsible curable layer to form a relief image on the printing plate; and

d) curing said curable layer by face exposure to crosslink and cure said formed relief image.

90. (Previously presented) A method according to claim 89, wherein the substrate is flat or cylindrical.

91. (Previously presented) A method according to claim 89, wherein said curable layer is cured by exposure to UV radiation.

92. (Previously presented) A method according to claim 89, wherein as the relief image is formed on the printing element, the printing element is simultaneously bump-exposed, to collapse at least a portion of said collapsible curable layer to create a final printing surface on said printing element.

93. (Previously presented) A method according to claim 89, further comprising a step of laser collapsing at least a portion of said formed image to form a denser printing surface.

94. (Previously presented) A method according to claim 89, wherein the curable elastomer of the collapsible curable layer comprises a binder, a plasticizer, one or more curable monomers, and a photoinitiator.

95. (Previously presented) A method according to claim 94, wherein said one or more curable monomers are curable by UV-light.

96. (Previously presented) A method according to claim 89, wherein the collapsible curable elastomer layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

97. (Previously presented) A method according to claim 89, wherein said laser is a plate setter infrared laser operating at a wavelength of 830 nanometers or 1064 nanometers.

98. (Previously presented) A method according to claim 97, wherein said material that absorbs laser light at the selected wavelength is selected based on the operating wavelength of the plate-setter laser.

99. (Previously presented) A method according to claim 96, wherein the material that absorbs laser light at the selected wavelength is an infrared dye or pigment.

100. (Previously presented) A method according to claim 99, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

101. (Previously presented) A method according to claim 89, wherein the laser is an IR-laser that uses different energy densities to create areas of different depths on the relief image.

102. (Previously presented) A digitally imaged relief-printing element comprising:

a collapsible curable layer comprising: (i) a curable elastomer, (ii) a material that absorbs laser light at the selected wavelength, and (iii) microspheres, on a substrate;

wherein the printing element comprises a relief image formed from selectively collapsed and melted portions of the collapsible curable layer; and

wherein the printing element is cured to cross link and cure said relief image.

103. (Previously presented) A printing element according to claim 102, wherein the substrate is flat or cylindrical.

104. (Previously presented) A printing element according to claim 102, wherein said curable layer is cured by exposure to UV radiation.

105. (Previously presented) A printing element according to claim 102, further comprising a collapsed top layer of the collapsible curable layer that creates a denser printing surface.

106. (Previously presented) A printing element according to claim 102, wherein an IR-laser is used to produce said selected collapsed and melted portions of the collapsible curable layer.

107. (Previously presented) A printing element according to claim 102, wherein the curable elastomer of the collapsible curable layer comprises a binder, a plasticizer, one or more curable monomers, and a photoinitiator.

108. (Previously presented) A printing element according to claim 107, wherein said one or more curable monomers are curable by UV-light.

109. (Previously presented) A printing element according to claim 102, wherein the collapsible curable elastomer layer comprises about 5% to about 15%, by weight, of the microspheres.

110. (Previously presented) A printing element according to claim 102, wherein the collapsible curable layer comprises about 0.01 to about 5 percent, by weight, of the material that absorbs laser light at the selected wavelength.

111. (Previously presented) A printing element according to claim 110, wherein said material that absorbs laser light at the selected wavelength is an infrared dye or pigment that is selected based on the operating wavelength of the IR-laser.

112. (Previously presented) A printing element according to claim 111, wherein the infrared dye or pigment is UV-transmissive at wavelengths between 350 and 400 nanometers.

113. (Previously presented) A printing element according to claim 112, wherein the IR-laser uses different energy densities to create areas of different depths on the relief image.